

**REMARKS**

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed June 13, 2005. Claims 5 and 6 were objected to. Claims 1-4, 7-11, and 18-21 were rejected. The claims have been renumbered to address the duplicate claim 19 as identified by the Examiner.

The indication of allowed claims 12-17 is acknowledged with appreciation. Applicant also thanks the Examiner for his careful consideration of this invention.

**Claim Rejections - 35 U.S.C. § 102**

Claims 1-4, 7-11, 18-20, (including independent claims 1, 3, 8, 9, and 19 ) were rejected under 35 U.S.C. § 102(b) as being anticipated by Bakcnov.

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to the originally presented independent claims with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

The cited prior art of Almaz Bakcnov's Thesis (Bakcnov) was supervised at Brigham Young University by Dr. Thomas W. Sederburg who is the inventor of the present application. Bakcnov contains an early formulation of T-Splines that expresses some of the potential of the preliminary idea. However, Bakcnov and Sederburg (his thesis supervisor) did not at the time have a deep enough understanding of T-Splines to make them actually useable. While Bakcnov does disclose the notion of a rudimentary T-junction control point, the details disclosed by Bakcnov were not usable. With the exception of rudimentary notions of this invention, none of the claimed elements of this patent application were understood in 2001.

In particular, claim 1 of the present invention includes

“inferring from the control mesh the tensor product B-spline basis functions for each control point; and  
computing the surface based on the basis functions and the control mesh.”

Bakenov does not teach or suggest inferring from the control mesh the tensor product B-spline basis functions. Nor does Bakenov teach computing the surface based on the derived basis functions and control mesh.

With regard to claim 2, Bakenov does not describe "the step of determining the basis function for each control point using one non-hierarchical set of rules."

With regard to claim 3, Bakenov does not describe a general method for locally refining a T-Mesh but only describes refinements in a very special case. The Office Action states that Bakenov describes a method for local refinement. However, the Section 2.6 of Bakenov cited by the Office Action discusses the well-known local refinement of B-Spline curves. What is claimed in the present invention is a solution to the problem of performing local refinement of surfaces. This refinement problem is a significant long-standing academic problem that T-Splines was the first to solve with the present invention. Bakenov does not teach or suggest this idea, because Bakenov and Sederburg did not know how to solve this problem in 2001 (nor did anyone else in the world).

With regard to claim 4, Bakenov does not describe a method for splitting basis functions, because T-Splines basis functions were not known in 2001.

With regard to claim 5, sharp creases were not discussed in Bakenov. Furthermore, semi-sharp creases were not discussed in Bakenov and thus claim 6 should be allowed.

Claim 7 pertains to the merging of two NURBS surfaces into a single T-Spline. This procedure was disclosed in Bakenov. However, the "local refinement" step included in claim 7 is not described in Bakenov.

With respect to claim 8, no mention of control meshes of arbitrary topology is made in Bakenov.

In reference to claim 9, the claimed procedure of inserting a single control point anywhere in a T-mesh is not described in Bakenov, nor is any functionally equivalent method described. Claim 10 describes further detail for the process of claim 9 and likewise is not taught or suggested in Bakenov. The details of claim 11 are dependent upon claim 9 and claim 9 is patentably distinct.

Bakenov does not teach or suggest a method for extracting Bezier patches from a surface. As a result claim 18 should be allowed.

With respect to claim 19, while Bakenov has discussed merging T-splines, Bakenov does not teach or suggest in generality how to insert arbitrary control points into a T-mesh.

Renumbered claims 20 and 21 are dependent on claim 19 and should also be allowed.

With respect to re-numbered claim 22, a locally refineable surface of any degree is not taught or suggested anywhere in Bakenov.

### CONCLUSION

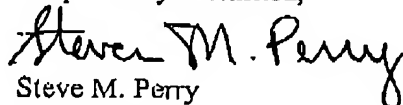
In light of the above, Applicant respectfully submits that pending claims 1-22 are now in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call Steve M. Perry at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge Deposit Account No. 20-0100 for a 1 month extension of time pursuant to 37 C.F.R. § 1.136. No claims were added or canceled. Therefore, no additional fee is due.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 15th day of September, 2005.

Respectfully submitted,



Steve M. Perry  
Registration No. 45,357

THORPE NORTH & WESTERN, LLP  
Customer No. 20,551  
P.O. Box 1219  
Sandy, Utah 84091-1219  
Telephone: (801) 566-6633